

# AMERICAN MUSEUM NOVITATES

Number 575

Published by  
THE AMERICAN MUSEUM OF NATURAL HISTORY  
New York City

Oct. 22, 1932

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56.9 (1181:82.9)

## SOME NEW OR LITTLE-KNOWN MAMMALS FROM THE *COLPODON* BEDS OF PATAGONIA.<sup>1</sup>

BY GEORGE GAYLORD SIMPSON

The expeditions of Professor F. B. Loomis for Amherst College and of Mr. E. S. Riggs for the Field Museum of Natural History did extensive work in the *Pyrotherium* and *Colpodon* Beds of Patagonia, greatly supplementing the pioneer work of the brothers Ameghino. It was the chief purpose of the Scarritt Patagonian Expedition of The American Museum of Natural History to do a similar service for the still earlier and less known *Notostylops* fauna, and most of our collecting was confined to this and the associated *Astraponotus* fauna. Nevertheless for purposes of stratigraphic determination and to supplement the Museum collections, some work was done also on the two faunas which intervene between the *Astraponotus* Beds and the great marine Patagonian Formation: the *Pyrotherium* and *Colpodon* faunas of Ameghino.

By an arrangement between the two institutions, it is planned that the two earlier faunas, *Notostylops* and *Astraponotus*, shall be revised at the American Museum, and the two later, *Pyrotherium* and *Colpodon*, at the Field Museum, but in each case a few especially interesting or complete specimens will first be described briefly and published by the museum for which they were collected.

The present paper is the first of three in which a few of the specimens found by the Scarritt Patagonian Expedition in the *Pyrotherium* and *Colpodon* Beds will be briefly described and discussed. It includes the new marsupial material (other than borhyaenids), a new ground sloth, and a new rodent specimen, all from the *Colpodon* Beds. The next paper will be devoted to some interesting ungulate specimens from the *Pyrotherium* and *Colpodon* Beds, and another to the osteology and affinities of the typothere *Cochilius* of the *Colpodon* fauna. In this paper is also included a new species of marsupial found by the Field Museum party.

In addition to the courtesy of Dr. Doello-Jurado, don Carlos Ameghino, and others in connection with the study of the Ameghino Collection in Buenos Aires, so useful in the whole series of studies of which this is one, I am now further indebted to Drs. W. B. Scott and W. J. Sinclair

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<sup>1</sup>Publications of the Scarritt Patagonian Expedition, No. 7.

of Princeton University for copies of photographs of various of the Ameghino types taken by Professor Scott, and for permission to reproduce some of them. The drawings in this paper are by Mildred Clemans.

### MARSUPIALIA

Material collected by the Scarritt Patagonian Expedition in the *Colpodon* Beds south of Lago Colhué-Huapí includes nine specimens referable to marsupials other than borhyænids. These are of unusual interest, as they include a new species of *Microbiotherium*, two fine specimens of *Abderites crispus* Ameghino, and three specimens of a new and peculiar genus of Abderitinae. *Homunculites pristinus* (which appears to be a marsupial, as pointed out by Bluntschli) and *Palæpanorthus primus* are also represented, but by specimens not adding to previous knowledge.

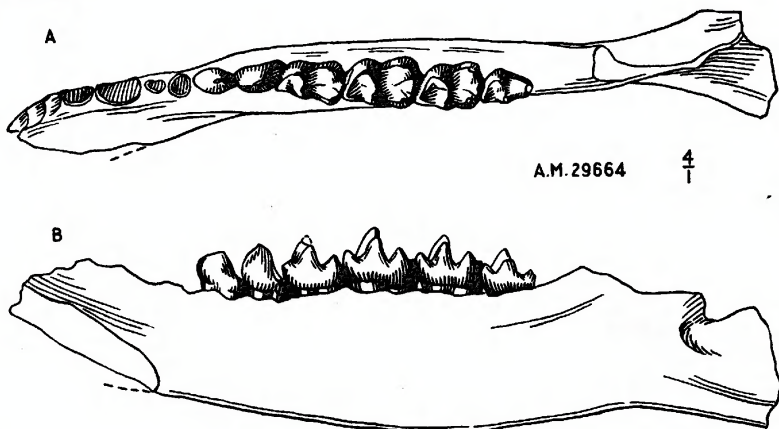


Fig. 1. *Microbiotherium hernandezii*, new species. Type, Amer. Mus. No. 29664, right lower jaw. A, Crown view. B, Internal view. Four times natural size.

### DIDELPHIIDÆ

#### *Microbiotherium hernandezii*<sup>1</sup>, new species

TYPE.—Amer. Mus. No. 29664, right lower jaw with crowns of  $P_2$ - $M_4$  and alveoli of other teeth. Collected by Justino Hernández.

HORIZON AND LOCALITY.—*Colpodon* Beds south of Lago Colhué-Huapí, Chubut, Argentina.

DIAGNOSIS.—About the size of *M. tortor*. Premolars in contact, but not obliquely placed, all of nearly equal length.  $P_3$  not higher than  $M_{1-3}$ .  $M_4$  proportionately smaller than in *M. tortor*. Molars typical of the genus in structure. Symphysis slender.

<sup>1</sup>Justino Hernández, field member of the expedition.

*Pachybiotherium* Ameghino, from these same beds, is probably synonymous with *Microbiotherium*, being distinguished only by having the lower jaw bowed or curved laterally, a feature of doubtful significance and no generic value when accompanied, as it seems to be, by full agreement in dental structure. The present species, however, is much smaller than the sole species assigned by Ameghino to *Pachybiotherium*, *P. acclinum*. The only other possible didelphid yet described from the *Colpodon* Beds is *Oligobiotherium divisum*. This nearly agrees with the present species in size, but Ameghino describes this form as having only two trigonid cusps on  $M_3$  and only one on  $M_4$ ,  $M_3$  with the talonid cusps in a straight transverse series, and  $M_4$  with a large basined talonid—characters so distinctive that it is doubtful whether *Oligobiotherium* belongs in this family at all.

There seems to be no character by which this earlier species can be excluded from the Santa Cruz genus *Microbiotherium*, although it differs from each of the known Santa Cruz forms in minor characters, such as size and tooth emplacement and proportions.

A character common to all microbiotheres in the broadest sense and not fully brought out by Sinclair's material is well shown by this fine specimen. In the whole group  $M_4$  is reduced, in varying degree in various species or genera, and has the talonid especially very much reduced, narrower and shorter than the trigonid, slightly basined and with a single median posterior cusp. The trigonid is normal except that paracoid and metaconid tend to be more nearly equal than on  $M_{1-3}$ .

Measurements.— $M_{1-4}$ —7.8 mm.

## CÆNOLESTIDÆ

### Cænolestinæ

Ameghino recorded the presence of this subfamily (his Garzoniidæ) in the *Colpodon* Beds as follows (1902, p. 55): "GARZONIA, sp. Quelques débris, indiquent l'existence d'une espèce de ce genre, de taille excessivement petite, mais ils sont insuffisants pour une détermination plus précise." This may refer to the species described below. *Pitheculites minimus* was also described from these beds by Ameghino, who considered it as a primate ancestral to the recent Neotropical primates, to the anthropoid apes, and to man. It is very clear, however, that *Pitheculites* is also a member of the Cænolestinæ, and hence, of course, has nothing to do with the primates.

***Halmarhiphus riggsi*,<sup>1</sup> new species**

TYPE.—Field Museum No. P13639. Fragment of left lower jaw with  $M_{2-3}$  and broken  $M_4$ .

HORIZON AND LOCALITY.—*Colpodon* Beds, south of Lago Colhué-Huapí, Chubut, Argentina.

DIAGNOSIS.—Length  $M_{2-3}$ —3.3 mm. Trigonid considerably narrower than talonid on both  $M_{2-3}$ .  $M_4$  long and narrow, two-rooted. Horizontal ramus very shallow in proportion to size of teeth.

The very characteristic molar structure of this species is identical with that of *Halmarhiphus nanus* (and presumably other species of the genus) of the Santa Cruz Formation.

Especially noteworthy are the small trigonids, little if any higher than the talonids but not so deeply basined, with two main cusps, the inner one bifid at the tip, and a small anterior median projection. The size and various proportions of teeth and jaw are different in the present form from any Santa Cruz species, but because of this identity in molar structure I do not feel justified in making a new genus for this earlier species, although this might prove necessary were it more fully known.

*H. riggsi* is very slightly smaller than *Pitheculites minimus*, in which  $M_{2-3}$  are said to measure 3.5 mm. in length. On this basis the two would appear probably synonymous, but if Ameghino

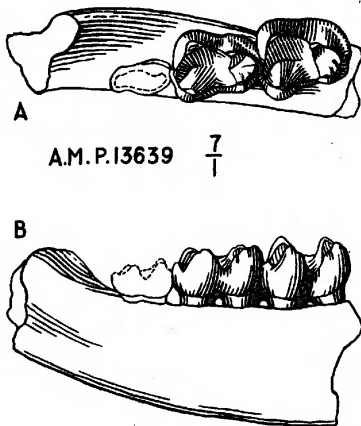


Fig. 2. *Halmarhiphus riggsi*, new species. Type, Field Mus. No. P13639, left lower jaw. A, Crown view. B, Internal view. Seven times natural size.

and his artist have correctly described and figured *Pitheculites*, its molar structure differs. The trigonids appear to lack the median anterior fold, to lack the characteristic tall, bifid structure of the inner cusp and in general to be less reduced relative to the talonids. If the teeth are correctly placed by Ameghino, *Pitheculites* also has  $M_3$  wider than  $M_2$ , rather than narrower as in *Halmarhiphus*, but his specimen may have been  $M_{1-2}$  rather than  $M_{2-3}$ . It is possible that *Halmarhiphus riggsi* is the same species as *Pitheculites minimus*, but this can be true only if Ameghino's description and figures are incorrect in detail, an unwarranted assumption.

<sup>1</sup> E. S. Riggs, leader of the First Marshall Field Paleontological Expedition to Argentina and Bolivia.



In any event they are related, at least closely enough to be placed in the same subfamily.

I am indebted to E. S. Riggs and other authorities of the Field Museum for the opportunity to include this specimen in the present study. Bryan Patterson had already examined it and recognized it as a probably new *cænolestine*.

#### ABDERITINÆ

##### *Abderites crispus* Ameghino

*A. crispus*, AMEGHINO 1902, p. 120.

Amer. Mus. Nos. 29663 and 29667 may be referred to this species.

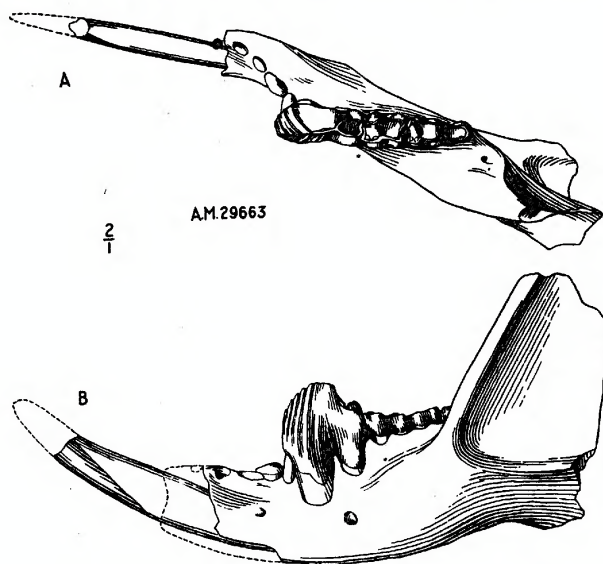


Fig. 3. *Abderites crispus* Ameghino. Amer. Mus. No. 29663, left lower jaw. A, Crown view. B, External view. Twice natural size.

The former is a left lower jaw with the incisor,  $P_{2-3}$ , and  $M_{1-4}$ , and is thus one of the most perfect specimens of any member of this subfamily yet described. The jaw is short and deep, rodent-like in its marked obliquity to the cheek tooth series. The large, laterally compressed incisor extends upward well above the dental border level, and had, except probably at the very tip (broken), a limited band of enamel on the lower part of the outer face; the root is closed. It was followed by four spaced, single-rooted, vestigial teeth, the last of which (the only one

with crown preserved) has a simple, flattened, oval, non-cuspidate crown. The next tooth,  $P_3$ , is also vestigial but of different form: styloid and stoutly buttressing  $M_1$  by insertion into a notch in the anterior end of the latter, exactly as the penultimate premolar buttresses the large shearing tooth in *Ptilodus*. The shearing  $M_1$  had six main ridges on the sides and corresponding apical denticles. The molars are worn, but clearly had separate trigonids and larger talonids, the trigonids with one *inner* and two *outer* cusps, the talonids with one main outer cusp and two or three minor and partly confluent inner cusps.

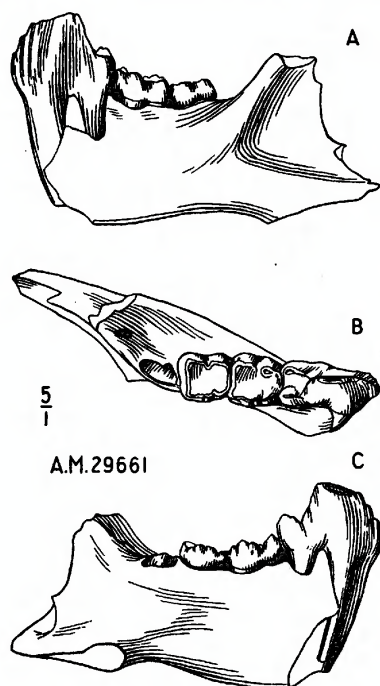


Fig. 4. *Micrabderites williamsi*, new genus and species. Type, Amer. Mus. No. 29661, left lower jaw. A, External view. B, Crown view. C, Internal view. Five times natural size.

### *Micrabderites*,<sup>1</sup> new genus

TYPE.—*M. williamsi*.

DISTRIBUTION.—*Colpodon* Beds, Patagonia.

DIAGNOSIS.—Abderitinae with  $M_1$  notched anteriorly for  $P_3$  as in *Abderites*,  $M_1$  with few striae and denticles (three in type), trigonid and talonid poorly differentiated on  $M_2$ , not distinct on  $M_3$ ,  $M_{2-3}$  with three trigonid cusps, one internal and two external, and five talonid cusps, three internal with connate bases forming an anteroposterior crest and two external. Species minute.

This is clearly a close relative of *Abderites* but is too distinctive for inclusion in that genus. It does not appear to be more primitive, but may be considered as a separate dwarfed phylum of the subfamily. The relatively small number of serrations on  $M_1$  suggests the contemporaneous *Parabderites*, but that genus has a large, shearing, two-rooted  $P_3$ , whereas in *Micrabderites*, as in *Abderites*,  $P_3$  clearly was styloform and inserted in a notch in the base of  $M_1$ .

### *Micrabderites williamsi*,<sup>1</sup> new species

TYPE.—Amer. Mus. No. 29661, left lower jaw with  $M_{1-3}$ . Found by Justino Hernández.

PARATYPES.—Amer. Mus. No. 29662, left lower jaw with  $M_{2-3}$ . Found by Justino Hernández.

<sup>1</sup>*Mixos*, small + *Abderites*.

<sup>2</sup>Coleman S. Williams, member of the Scarritt Patagonian Expedition.

Amer. Mus. No. 29666, left lower jaw with  $M_{1-2}$ . Found by G. G. Simpson.

HORIZON AND LOCALITY.—*Colpodon* Beds, south of Lago Colhué-Huapí, Chubut, Argentina.

DIAGNOSIS.—Sole known species of the genus, length  $M_{1-3}$ —5.0 mm.

This is much the smallest species yet described in this subfamily and cannot be confused with any other.

#### MEASUREMENTS

Length $M_{1-3}$ .....	4.9 mm.
$M_1$ length.....	2.5
$M_2$ length.....	1.4
$M_3$ length.....	1.0

### XENARTHRA

#### MEGALONYCHIDÆ

#### *Proschismotherium scarritti*,<sup>1</sup> new species

TYPE.—Amer. Mus. No. 29659, lower jaws complete anterior to the dental foramina on both sides, with all left teeth and second and third right. Found by G. G. Simpson.

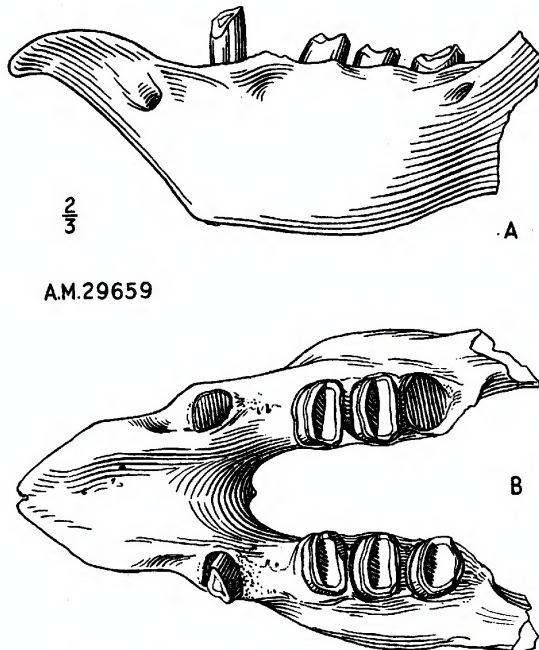


Fig. 5. *Proschismotherium scarritti*, new species. Type, Amer. Mus. No. 29659, lower jaw. A, Left lateral view. B, Crown view. Two-thirds natural size.

<sup>1</sup>Horace S. Scarritt, principal patron of the expedition.

HORIZON AND LOCALITY.—*Colpodon* beds, south of Lago Colhué-Huapi, Chubut, Argentina.

DIAGNOSIS.—A relatively large early gravigrade within the presumable size range of *Eucholæops ingens*, and 20-40% larger than *Proschismotherium oppositum*. First lower tooth large, triangular, with subequal anterior and external faces at right angles, the latter grooved vertically. Last lower tooth round to oval, long axis oblique. External margins of the four alveoli nearly in a straight line. Spout relatively large and wide for this genus. Symphysis steep, strong genial tubercle. Horizontal ramus deep and stout. External dental foramen well down on outer face, below posterior edge of last tooth.

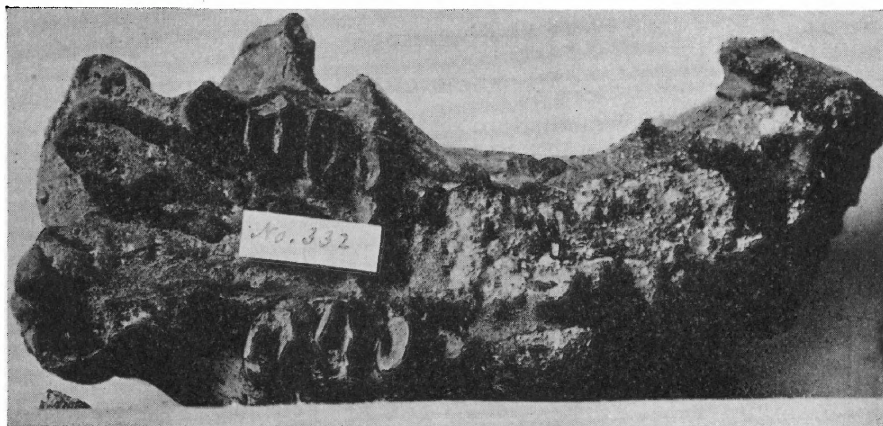


Fig. 6. *Proschismotherium oppositum* Ameghino. Type, in Museo Nacional de Historia Natural, Buenos Aires. (The number refers to the photograph and is not a catalogue number.) Palatal view. Photograph by Professor W. B. Scott. About natural size.

*Proschismotherium* appears to be either synonymous with or closely related to the Santa Cruz genus *Eucholæops*. Ameghino's definition clearly shows that *Proschismotherium* is distinct from *Schismotherium*, but no really important difference from *Eucholæops* is shown by his specimen. The present specimen is referred to *Proschismotherium* tentatively because it comes from the horizon of that genus and, like it, closely resembles *Eucholæops*.

If correctly referred, this species tends in some measure to confirm the generic validity of *Proschismotherium*. It differs from all Santa Cruz species of *Eucholæops* in the relatively larger, more flaring spout, less strong notch anterior to the first tooth, somewhat distinctive shape and orientation of this tooth, and more backward inclination of the other teeth. In no case is the difference great, and each of these characters is nearly approached by some species of *Eucholæops*, but in sum they may suggest that the genera will prove distinct when better known.



*Proschismotherium oppositum* is known from the upper jaw only, but if the ratios were at all as in *Eucholæops*, as they must have been, the present species is at least 20% and perhaps as much as 40% larger, so that the two can hardly be synonymous. The only other known *Colpodon* Beds gravigrades are three species referred to *Hapaloïdes*, which differs from *Proschismotherium* (including *P. scarritti*) in the less external first teeth of upper and lower jaws, the same distinction as between *Hapalops* and *Eucholæops* in the Santa Cruz fauna. *P. scarritti* is also larger than any of the three species placed in *Hapaloïdes*.

#### Measurements

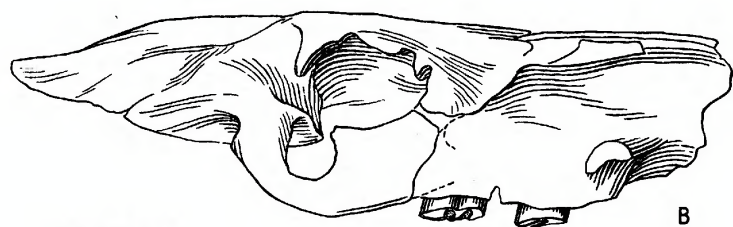
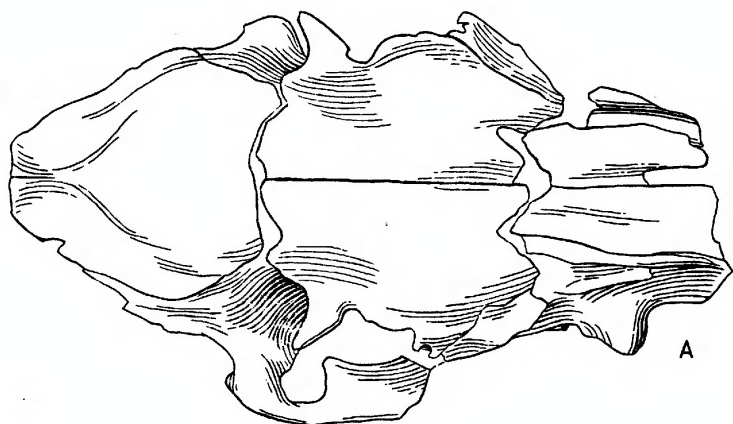
Length tip of spout to level of beginning of tooth series . . .	35 mm.
Length lower tooth series (at alveoli) . . . . .	47.5
Length, posterior three teeth . . . . .	31.5
First tooth { Length . . . . .	7
{ Width . . . . .	7
Second tooth { Length . . . . .	8
{ Width . . . . .	11.5
Third tooth { Length . . . . .	8
{ Width . . . . .	12
Fourth tooth { Length . . . . .	9.5
{ Width . . . . .	10.5

### RODENTIA

#### CHINCHILLIDÆ

##### *Perimys incavatus* Ameghino, 1902

To this species may be referred Amer. Mus. No. 29660, a skull lacking the rostrum, occiput, and basicranium, found by me in the *Colpodon* Beds south of Lago Colhué-Huapí. The specific reference is somewhat dubious. *Perimys transversus*, *Perimys incavatus*, and the present specimen are within about 5% of being the same size. Ameghino separated his two species on the basis of lower teeth, absent in our specimen, stating that in *P. transversus* the inner side is rounded except on  $M_3$ , while in *P. incavatus* it has a vertical groove on all the lower cheek teeth. Now, judging from the Santa Cruz species, this groove, never very much accentuated, is a somewhat variable feature both individually and with the degree of wear. This, with the improbability that two species so closely similar and of the same size really lived together, makes it at least possible that the species are synonymous. In any event, it would be preferable to retain the name *P. incavatus*. It was published a few lines below *P. transversus*, but at the same time, and priority of position is not legally imposed and should not weigh against



A.M.29660

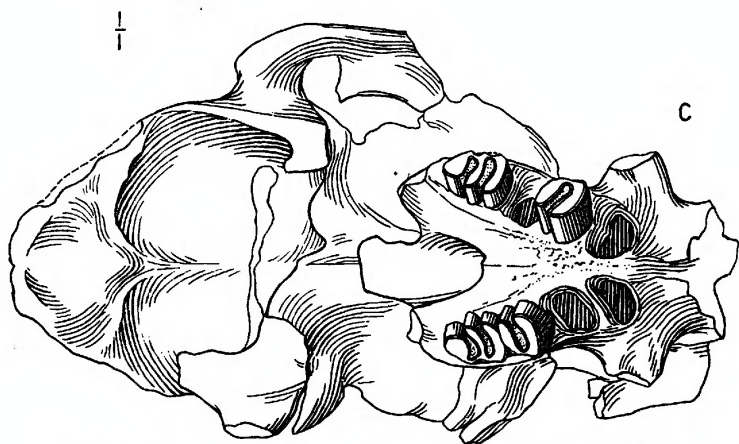


Fig. 7. *Perimys incavatus* Ameghino. Amer. Mus. No. 29660, partial skull. A, Dorsal view. B, Right lateral view. C, Palatal view. Natural size.

the fact that *P. incavatus* was based on a much better type and was more fully and accurately defined.

Ameghino had a partial skull of *P. incavatus* but did not figure or fully describe it. The chief interest lies in comparison with the Santa Cruz species of the genus, particularly with *P. impactus*, *P. puellus*, and *P. erutus*, of which Scott has described partial skulls. The general result of this comparison is that the *Colpodon* Beds form is quite distinc-

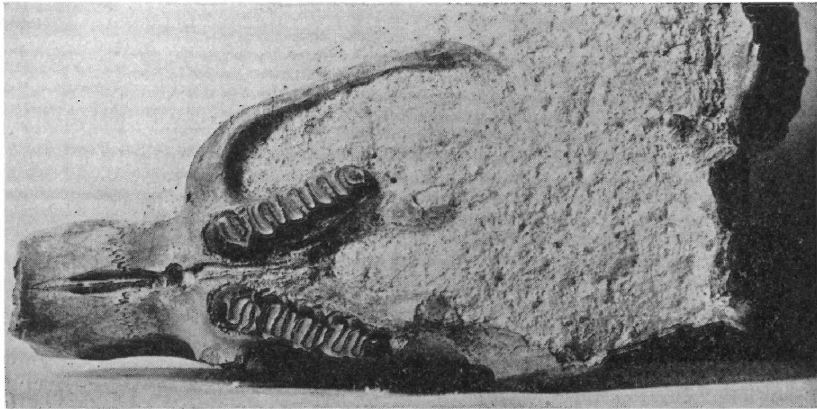


Fig. 8. *Perimys incavatus* Ameghino. Type, in Museo Nacional de Historia Natural, Buenos Aires. Palatal view. Photograph by Professor W. B. Scott. Slightly less than natural size.

tive, but not in any way that can be given definite phylogenetic significance. It does not appear to be more primitive so far as can be determined.

The size is slightly smaller than *P. impactus*, considerably larger than *P. puellus* or *erutus*, and about equal to *P. onustus*, judging from the lower jaw of the latter.

$P^4$  is lost from our specimen, and  $M^{1-2}$  are not distinctive.  $M^3$  differs from most or all of the Santa Cruz species in the character of the third lamella, which is relatively narrow (transversely) and long (antero-posteriorly), the two dimensions being nearly equal as opposed to the preponderance of the width in the later species. This tooth also has a shallow vertical external groove opposite the second lamella. Both these characters are also present in the type and seem to be true specific distinctions.

The palate is very narrow anteriorly, only 2 mm. between the alveoli of  $P_4$ , absolutely less than in the much smaller *P. erutus*. The choanæ

extend somewhat farther forward than in *P. impactus*, but not more than in *P. erutus*—Ameghino says that they are deeper in his type of *P. incavatus* than in any Santa Cruz species but the difference from our specimen is slight. The skull roof is chiefly remarkable for its flatness. The frontals are very feebly domed by sinuses, less so than in Santa Cruz species of comparable size. Most notable is the very slight flexure downward of the cranium with respect to the frontal region, the parietals lying nearly in the same plane as the frontals. This may in part be due to crushing, but not wholly so, particularly as the flatness of the skull roof was also noted by Ameghino in his type. The parietal crests are feebler than in *P. impactus* and, probably, other Santa Cruz species, and the sagittal crest is also relatively weaker and shorter although it is present. Its reported absence in Ameghino's type is merely due to its being broader than in our specimen. The postorbital processes are a little longer relatively than in *P. impactus*, and the notch in the superior orbital rim anterior to the postorbital process is sharply incised. In the anterosuperior margin of the orbit, in the position of the lacrymal and perhaps in that bone although this is not clear, are two small very deep notches, almost closed foramina. The zygoma is relatively somewhat stouter than in *P. puellus*, and the notch beneath or slightly anterior to the postorbital process very large and almost circular.

The roof of the endocranium is exposed, but it reveals nothing very noteworthy. The brain appears to have been much as in recent chin-chillids and probably not proportionately smaller, with large, feebly convoluted cerebrum and almost fully exposed cerebellum.

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